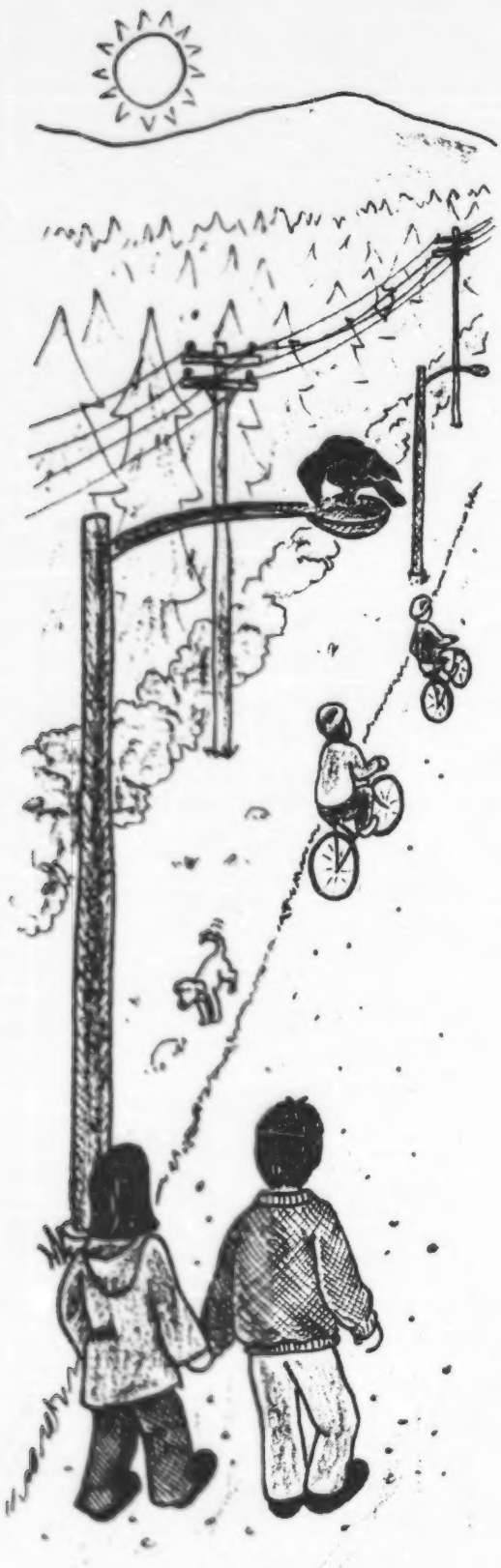

Green Power Fund

1998

Cabinet Commission on Energy

Yukon Government

Cabinet Commission on Energy
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Green Power Fund

The purpose of a Green Power Fund would be to make buying electricity from clean, environmentally safer sources — such as wind, small hydro and solar — as popular as recycling is today. Buying green electricity is a simple and effective way for Yukon people to make an immediate environmental difference and help build a sustainable future.

Green Power is electricity generated from renewable energy sources that have little or no environmental impact on air or water. Renewable energy sources are constantly replenished by the earth's natural processes. While large hydroelectric projects are based on a renewable resource, they have a more complex set of environmental impacts and are typically excluded from this type of initiative.

For the purposes of a Green Power Fund, "green" power is clean, renewable power that is generated by harnessing the energy of renewable sources such as the sun, wind and flowing rivers. Green power also includes the use of heat found deep within the earth's core (geothermal energy), converting the energy stored in plant matter (biomass), and capturing the methane gas that otherwise escapes from our landfills and contributes to global climate change. Efficient technologies, such as fuel cells, can also be considered clean power sources because they are able to operate on a variety of fuel sources and emit minimal levels of pollution.

The money from a Green Power Fund would be used to offset the additional costs associated with green power by either the existing utilities or independent power producers. For Yukon Energy Corporation (YEC) and Yukon Electrical Company Ltd. (YECL), the Green Power Fund would pay the difference between the utilities' cost of generation and any higher costs of generation from new renewable resources. In the case of independent power producers, the Green Power Fund would pay the difference between what it would cost the utilities to generate a given amount of electricity and what it actually costs an independent power producer to generate the same amount of electricity. In both instances, the Green Power Fund would be used to ensure that ratepayers are not required to absorb any higher generation costs.

A second aspect of a Green Power Fund could be to assist with the capital costs of alternative energy production facilities. In both cases, the objective would be to assist in establishing the long-term viability and cost effectiveness of generating electricity from renewable energy sources and to encourage a continuing market for renewable energy. Issues such as administration and accountability for a Green Power Fund would need to be dealt with through consultation prior to implementation.

Can you really buy green electricity? Yes. Think of the electricity grid as a pool of power. Power generators pour electricity into the pool; you and other consumers take electricity out. Although

you can't specify which molecules you take out, as a green customer you can ensure that generators pour "green" electricity into the pool at the same rate you remove it.

Yukon people are looking to continue building foundations for the future. A Green Power Fund should be viewed from a long-term perspective as one of many efforts to replace the reliance on diesel generation in some communities with more green power for Yukon people over time. This initiative ties in with Canada's recent commitment at the international climate change negotiations held in December, 1997, in Kyoto, Japan, to reduce greenhouse gas emissions to a level six percent below 1990 levels by 2012.

Funding

Various options are available for funding a Green Power Fund. One is to give electrical ratepayers the option to contribute voluntarily to a fund. In return, their monthly electricity needs would be supplied, at least in part, by Green Power purchases from renewable energy sources. Possibilities also exist for special partnership contributions towards capital costs, which could reduce amounts needed from a Green Power Fund on an ongoing basis. Other sources of funding include some of the funds currently designated for rate relief, special donations from non-governmental organizations or individuals, and revenues from industry or other governments for emissions trading.

Emissions trading would allow one country, province or business to provide financial assistance to reduce gas emissions or to share reduced emissions. An example of this is the recently announced agreement between Suncor Energy Inc. and Niagara Mohawk Power Corporation, of Syracuse, New York, in which Suncor Energy has agreed to make an initial purchase of 100,000 metric tonnes of greenhouse gas emission reductions from Niagara Mohawk with an option to buy up to an additional 10 million tonnes of reductions over a 10-year period. This agreement is designed to help Suncor Energy achieve its voluntary emission reduction targets while providing Niagara Mohawk with additional funding for new projects that will further reduce global concentrations of greenhouse gases in the atmosphere.

Uses

One of the driving forces behind Green Power initiatives in the Yukon and other jurisdictions is the potential to displace less environmentally-friendly sources of electricity generation, such as diesel or coal. Sources of Green Power will be most effective at various times during the year (wind in winter, run-of-river hydro in summer), so the benefits of displacing other sources of generation will vary depending on what is being displaced and when.

As an illustration, a 5-megawatt wind farm project in the Yukon that would generate approximately 10 gigawatts of electricity at a cost of 12 to 15 cents per kilowatt-hour could be partially funded by a Green Power Fund to ensure that its operation does not increase the cost of generation on the

existing electricity system. In winter, wind-sourced electricity could displace diesel generation, which costs from 10 cents per kilowatt-hour on the Whitehorse-Aishihik-Faro system to much more in remote communities.

This suggests that, at least for the first few years of operation, a Green Power Fund might need to contribute up to $42,000 per winter month ((10 gigawatt/12 months) x 5 cents per kilowatt-hour) on the Whitehorse-Aishihik-Faro system to offset the higher operating costs of the wind farm during its most productive (winter) months. Production costs from a wind farm reduce after the first few years of operation as capital costs are recovered through depreciation.

The biggest potential for displacing diesel generation would be in communities that now use diesel exclusively to generate electricity.

A Green Power Fund could be designed to assist with the capital costs of alternative energy facilities. This would, in turn, reduce or eliminate funds required on an ongoing basis.

For some electricity consumers, knowing their efforts are contributing to the environmental well-being of the Yukon may be enough to convince them to support a Green Power initiative. Special recognition of ratepayer contributions, possibly in the form of special stickers and other promotional materials, could be considered to help advertise the program and reinforce the positive potential of individual efforts.

Rationale

The Yukon government considers efficiency and conservation the cleanest electricity supply options since they work to reduce the total electricity use and can result in avoided utility system costs by reducing future upgrade costs for transmission facilities. The establishment of a Green Power Fund is being considered to give electrical ratepayers the opportunity to ensure that more electricity is generated from renewable energy sources such as wind, water, solar, biomass and photovoltaics. It will also provide a vehicle to support the replacement of fossil fuel burning generation plants with cleaner resources.

Promoting sustainable energy resources reduces reliance on imported fossil fuels and supports an industry that will supply safe energy for future generations. It provides an incentive for utilities and others to explore new avenues for electricity supply. Green resources are also good sources of jobs and income because they rely on local labour, land and resources.

A Green Power Fund would allow individuals to send an unmistakable message to the energy industry and to policy makers that they want and will support technologies and resources that are not as harmful to the environment as traditional fossil fuel resources.

The goal of a Green Power Fund is to establish a strong base for clean, renewable power for the long-term future of the Yukon. Plugging into Green Power is a first step to ensuring that Yukon people will continue to have a sustainable supply of energy.

Glossary

Green power — Energy produced from resources that are replenished naturally and whose use minimizes harm to the environment. Included in this category are geothermal (natural underground steam), wind, solar, biomass and some types of small hydroelectric power.

Hydroelectric power — Electricity produced by generators that are turned by water. Dams usually hold the water in reservoirs.

Run of river hydro — A hydroelectric project where the water flow uses the natural flow of the river and the water is not controlled simply to enhance electric power production.

Small hydro — Often defined as a hydroelectric project with less than 20 megawatts peak output. The term is used to specifically exclude large hydroelectric projects which have a more complex set of environmental impacts.

Geothermal — Underground geysers produce steam that is captured and used to spin generators that create electricity. Deep wells, often greater than 10,000 feet deep, tap into steam trapped underground. Pipelines collect the steam and deliver it to electricity-producing turbines. Water left over after going through the turbine evaporates or is returned deep into the ground.

Wind turbines — The wind turns propellers mounted on towers. The propellers drive dynamos that generate electricity.

Solar photovoltaic cells — Solar photovoltaic cells are panels made of silicon oxide (what quartz is comprised of) that have minute layers of implanted "impurities." Sunlight releases streams of electrons from these layers. By collecting the electrons and directing them through electrical circuits, the sun's energy is converted to electricity.

Solar thermal electric — The use of solar concentration techniques to collect sunlight energy and boost the temperature of that heat energy. This pollution-free high-temperature heat can then be substituted for heat that might otherwise be produced from burning fossil fuels.

Biomass — Vegetation and other organic materials found in landfills and at sawmills produce methane gas as they decompose. This naturally occurring gas can be captured and used to power generators which, in turn, create electricity. Biomass can also be burned for its direct heat content, just like burning a fossil fuel.

Renewable energy source — A type of energy resource restored by nature. The wind, sun, rivers, tides and heat of the earth are considered renewable resources.

Independent power producers — Sometimes referred to as non-utility generators, these are companies or individuals that generate electricity for their own use, to sell to another user, or to sell to a utility. They are not regulated utilities.